ASSESSMENT OF ADOPTION OF IMPROVED SWINE MANAGEMENT TECHNOLOGIES AMONG FARMERS IN UKUM LOCAL GOVERNMENT AREA, BENUE STATE, NIGERIA

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Abstract
The study assessed adoption of improved swine management technologies among farmers in Ukum Local Government Area, Benue State, Nigeria. All the swine farmers in the study area constituted the population for the study. Data for this study were collected from primary source using structured questionnaire. Multistage sampling technique was used in selecting a sample size of 130 respondents. Data collected were analysed using frequency distribution, percentage, mean and standard deviation. The result revealed that majority (61.54%) of the respondents were males with a mean age of 40 years, 58.46% were married, with mean household size of 8 persons, 43.08% had secondary education, with mean of 9 pigs per household, with an average farming experience of 7 years, 67.79% were farmers who earned an income of N2,551,747.00, with an average of N1,298,385.00. Result on sources of information revealed that 86.15% got information from radio. On improved swine management technology, majority (87.69%) vaccinated their pigs and high cost of feeds ($\bar{x} = 3.55$) *was one of the major barriers to swine production. Swine farmers in the study area obtained information on swine production from radio, vaccinated their animals and had the major problem of high cost of feed. It is recommended that information on swine management should be disseminated through radio and farmers should be taught how to produce swine feeds.*

Keywords*: Assessment, Adoption, improved, swine management, technologies*

Introduction

Pigs (piglets of either sex weighing less than 120 pounds), were domesticated in China as early as 4900 B.C. Biblical writings mention them as early as 1500 B.C. (Before Christ) and there are references to the keeping of swine in Great Britain in 800 B.C. (Vernon & Douglas, 1985). Swine are raised in both warm and temperate climates, although piglets must be kept warm, and sheltered from weather extremes (Uddin and Osasogie, 2016). Swine production has been advocated as a short-term measure towards alleviating the protein and calorie deficit, especially where there are no religious edicts preventing their production and consumption [Food and Agriculture Organization (FAO, 2012)]. The pig industry in Nigeria is an important arm of the livestock sub-sector in the overall agricultural sector. (Uddin and Osasogie, 2016). Benue State is one of the largest pigs producing States in Nigeria and pig enterprise contributes significantly to the economy of the State with most of the pigs owned by small holders operating semi-intensive pig production system (Umeh *et al*., 2015; Asambe *et al.*, 2019).

Sustainable growth of pig production industries in Nigeria is adversely affected by factors such as unstructured marketing framework, fluctuation in the prices and products, cultural and religious prohibition of pork consumption, low demand for pork in some parts of the country, high cost of feeds, inadequate extension services, slow integration of cost-effective equipment and genetically enhanced breeds and disease outbreak (Anukwu and Ebong, 2011; Abiola *et al*, 2015; Igbokwe and Maduka, 2018). Productivity in piggery is measured by reproduction and growth performance and these are influenced by genetic factors, feeding, environment and management

practices (Greve, 2015). Efforts have been directed towards improving pig production through adequate nutrition, improved health and breeding development specifically through cross-breed with superior exotic breeds (Greve, 2015).

Objectives of the Study

The broad objective of this study was to assess adoption of improved swine management practices among farmers in Ukum Local Government Area (LGA) of Benue State, Nigeria and the specific objectives were to:

i. ascertain sources of information on improved swine management technologies in the study area;
ii. identify improved swine management technologies adopted by the respondents in the study area; and
iii. identify challenges to adoption of improved swine management technologies among the respondents

Methodology

The study was conducted in Ukum Local Government Area (LGA) of Benue State. The LGA is located at latitude 7^0.26′42′′N and longitude 9^0. 27′ 26′′N. The LGA is bounded by Katsina-Ala LGA to the South and Southwest, Logo to the West, North and East by Taraba State. Ukum LGA has a total area of 429 square kilometers with estimated population of 313,300 people according to (National population commission of Nigeria and National bureau of statistics, 2022). Farming is the major occupation of the people, with the area known for the cultivation of crops such as yam, groundnut, citrus, and maize. Trade is another important aspect of the economy hosting several markets such as the Gbeji and the Zaki-biam yam market, which is reputed to be the largest tuber market in West Africa. Farmers in the area also reared animals including goats, poultry, swine, and sheep. A few minerals are fund in the area including salt, few number of the people are civil servants. The population of the study consists of all swine farmers in Ukum Local Government Area of Benue State. Multistage sampling was used to select a sample size of 130 respondents based on intensity of swine production in the area. In the first stage, the population of the study was stratified into three zones; Zaki-Biam and Sankera (zone A); Ayati and Kyado (zone B), and Chito and Afia (zone C). In the second final stage one village each was selected from each zone based on intensity of swine production and thirdly a sampling frame was developed and 16.5% of the population was taken across all the villages which provided a total sample size of 130 respondents. Primary data were collected using structured questionnaire administered using Kobo collect, data collected were analyzed using frequency, tables percentages and mean.

Results and Discussion

Socio-economic Characteristic of Pig Farmers

Table 1 shows that majority (61.54%) of the respondents were males while 38.46% of the respondents were female. This finding indicates that farmers in the study were predominantly males. The dominance of male in swine production may be due to the perception that pigs are strong animals and need people with heavy strength to handle them. This finding is line with Abiola *et al.* (2015) that swine industry is male dominated sector and most of the farmers and farm attendants were male.

Table 1 also shows that about 34% of the respondents were within the age of 26-34 years with mean average of 40 years. This indicates that a few (34%) proportion of the respondents were in their active years. This could be attributed to the belief that pigs are strong animals which required people with a lot of energy to handle them. This result corresponds with Joseph *et al*. (2020) that most of the respondents were in active age group. The finding is in tandem with Ojoba and Enya (2020 that most of the respondents involved in pig production were in their active age.

Table 1 also reveals that majority (58.86%) of the respondents were married. This means that married people were more involved in pig production in the study area. The finding corresponds with

Joseph *et al*. (2020) that most pig farmers were married.

Table 1 also shows that most (54.62%) of the respondents had household size of 6-10 persons with a mean of 8 persons. This shows that people with large household size dominated the study area. Piggery enterprise requires a lot of labour for different farm operations, and those with large household size may be on advantage as they may not require to hire manpower outside their household to assist in carrying out farm activities. Family members could serve as a source of labour, and this would help in reducing the cost of hiring labour. The finding is in line with Onyekura *et al.* (2020) that the modal household size of the pig farmers was high.

Table 1 also shows that most (40%) of the respondents owned between 5 - 8 pigs with an average of 9. This means the farmers have small number of pigs. This is an indication that pig farmers in the study area operated on a small scale. Small scale farming of any enterprise has many limitations including lack of collateral, inadequate capital to expand their enterprise among others.

Table 1 depicts that a most (43.08%) of the farmers had secondary education. This means they can read and write, education plays a key role in adoption of innovations as people who are educated read and understand information concerning adoption, however, those who are not educated have to look for somebody to read and interpret instruction meant for adoption of improved technology. The finding is in contrast to Abiola *et al.* (2015) that there is low level of education among farmers especially those in the piggery enterprise.

Table 1: Socio-economic Characteristic of the Respondent (n=130)

Variables	Frequency	Percentage (%)	Mean
Sex			
Female	50	38.46	
Male	80	61.54	
Total	**130**	**100.00**	
Age (Years)			
≤ 25	13	10.00	
26-34	44	33.85	40
35-47	35	26.92	
48-60	27	20.77	
> 60	11	8.46	
Total	**130**	**100.00**	
Marital status			
Divorced	12	9.23	
Married	76	58.46	
Single	27	20.77	
Window/widower	15	11.54	
Total	**130**	**100.00**	
Household size (Persons)			
≤ 5	40	30.77	
6-10	71	54.62	
11-15	13	10.00	8
16-20	4	3.08	
> 20	2	1.54	
Total	**130**	**100.00**	
Level of education			
Non formal education	20	15.38	
Postgraduate	4	3.08	
Primary	21	16.15	
Secondary	56	43.08	
Tertiary	29	22.31	
Total	**130**	**100.00**	

Number of pigs			
≤ 4	27	20.77	
5-8	40	30.77	
9-12	35	26.92	9
13-16	11	8.46	
17-20	14	10.77	
> 20	3	2.31	
Total	**130**	**100.00**	
Farming experience (years)			
≤ 5	55	42.31	
6-10	54	41.54	7
11-15	15	11.54	
16-20	6	4.62	
Total	**130**	**100.00**	
Occupation			
Other	1	0.77	
Civil servant	12	9.23	
Farming	88	67.69	
Fishing	1	0.77	
Teaching	11	8.46	
Trade	17	13.08	
Total	**130**	**100.00**	
Annual income (Naira)			
≤ 1,500,000	79	60.77	
1,500,001-3,000,000	28	21.54	
3,000,001-4,500,000	3	2.31	
4,500,001-6,000,000	6	4.62	2,551,747
6,000001-7,500000	2	1.54	
7,500,001-9,000,000	3	2.31	
9,000,001-10,500,000	3	2.31	
10,000,001-12,000,000	1	0.77	
> 12,000,000	5	3.85	
Total	**130**	**100.00**	
Income before adoption (Naira)			
≤ 500,000	58	44.62	
500,001-1,000,000	42	32.31	
1,000,001-1,500,000	6	4.62	1,298,385
1,500,001-2,000,000	9	6.92	
2,000,001-2,500,000	2	6.92	
2,500,001-3,000,000	1	0.77	
3,500,001-4,000,000	2	1.54	
> 4,000,000	10	7.69	
Total	**130**	**100.00**	
Income after adoption (Naira)			
≤ 500,000	49	37.69	
500,001-1,000,000	50	38.46	
1,000,001-1,500,000	6	4.62	
1,500,001-2,000,000	10	7.69	1,584,054
2,500,001-3,000,000	2	0.77	

3,500,001-4,000,000	1	9.23	
> 4,000,000	12		
Total	**130**	**100.00**	
Non-farm income			
≤ 200,000	73	56.15	
200,001-400,000	22	16.92	520,554.3
400,001-600,000	11	8.46	
600,001-800,000	4	3.08	
800001-1,000,000	11	8.46	
1,000,001-1,200,000	1	0.77	
1,400,001-1,600,000	1	0.77	
> 1,600,000	7	5.38	

Sources of Information

Table 2 shows that majority (86.15%) of the respondents got their information from radio set, while 80% of the respondents got theirs from friends/neighbor. This result showed that majority of the respondents got their information from radio, this is because, radio set is cheap to procure and maintain, Besides, there are also many radio stations at different locations in Benue State including Ashiwaves, Joy FM, Radio Maria and Aget Radio among others. The radio stations provide valuable information to farmers, radio is manufactured in various sizes that make it very portable to be listened to even on the move, and radio can also be powered by cheap small dry batteries. The finding agrees with Kughur *et al*. (2016) who stated that the transistor radio is cheap and portable means of information dissemination, mostly used by farmers in Benue State.

Table 2: Distribution of respondents according to Sources of farm Information (n=130)

Sources of farm information	Frequency	Percentage (%)
Television	72	55.38
Radio	112	86.15
University	25	19.23
Farmers contact	92	70.77
Friends/neighbor	104	80
Workshop contact	37	28.46
Extension worker	63	48.46
Exhibit	35	26.92

* Multiple responses *

Improved Swine Management Practices

Table 3 shows that majority (87.69%) of the respondents adopted vaccination, 82.31% adopted weaning, 73.07% deworming, 72.31% dairy routine and 66.92% adopted improved feeds among others. This result shows that majority (87.69%) of the respondents adopted vaccination. Vaccination is one of the primary and essential management practices that when properly practiced is capable of making the animals to live healthy and produce very well because it serve as preventive measure for different types of diseases. All farmers who keep animal are encouraged to ensure they vaccinate their animals regularly using the required dosage at the appropriate time to make them healthy for consumption.

Table 3: Distribution of respondents based on Improved Management Technologies (n= 130)

Variables	Frequency	Percentage (%)
Vaccination	114	87.69
Deworming	95	73.07
Artificial insemination	27	20.77
Tick control	75	57.69
Weaning	107	82.31
Tail docking	45	34.62
Clipping of needle teeth	50	38.46
Dairy routine	94	72.31
Provision of biosecurity	58	44.62
Concrete wallow	57	43.85
Improved feed	87	66.92

*Multiple responses *

Challenges to adoption of improved swine management technologies

Table 3 shows that high cost of feeds ($\bar{x} = 3.55$), high cost of transportation ($\bar{x} = 3.45$) and lack of organized market structure ($\bar{x} = 3.28$) among others were some of the major challenges militating against swine production. High cost of feeds is one of the major barriers to swine production, it has caused many producers to close their swine enterprise. Pigs eat very frequently and without proper feeding, it cannot grow to attain market weight. This finding agrees with Ume *et al*. (2018) that most veterinary diseases are associated with improper feeding, when animals are fed properly it prevents animals from disease attacked.

Table 3: Distribution of respondents sccording to challeges in adoption improved swine management (n=130)

Variables	Strongly agree		Disagree		Agree		Strongly agree		Mean	SD
	Freq	%	Freq	%	Freq	%	Freq	%		
Lack of high-quality breeding stock	10	7.69	31	23.85	44	33.85	45	34.62	2.95	0.93
Inadequate infrastructure	6	4.62	23	17.69	58	44.62	43	33.08	3.06	0.83
Lack of technical know how	7	5.38	49	37.69	48	36.92	26	20.00	2.71	0.85
Lack of organized market structure	6	4.62	9	6.92	58	44.62	57	43.85	3.28	0.79
Air pollution	29	22.31	41	31.54	21	16.15	39	30.00	2.54	1.14
Climate change	15	11.54	50	38.46	40	30.77	25	19.23	2.58	0.93
Disease outbreak	18	13.85	23	17.69	35	26.92	55	41.54	2.96	1.07
Lack of access to credit facilities	3	2.31	14	10.77	43	33.08	70	53.85	3.38	0.77
Veterinary posts (offices)	11	8.46	24	18.46	41	31.54	54	41.54	3.06	0.97
Water pollution	32	24.62	24	18.46	41	31.54	33	25.38	2.58	0.95
High cost of feeds	1	0.77	6	4.62	43	33.08	80	61.54	3.55	0.62

High cost of transportation	1	0.77	5	3.85	58	44.62	66	50.77	3.45	0.61
Security challenges	3	2.31	23	17.69	49	37.69	55	42.31	3.20	0.81
Inadequate waste disposal	40	30.77	23	17.69	24	18.46	43	33.08	2.53	1.23
No extension contacts	13	10.00	28	21.54	38	29.23	51	39.23	2.97	1.00
Communal conflict	8	6.15	30	23.08	44	33.85	48	36.92	3.02	0.92
Poor road network	7	5.38	14	10.77	46	35.38	63	48.46	3.27	0.86

Conclusion and Recommendations

The study concluded that farmers in the study area mostly got information from radio followed by friends and neighbours, they also adopted vaccination and weaning. The study also reports *numerous challenges on the farm like lack of high-quality breeding stock, disease outbreak, and lack of access to credit facilities, veterinary cost, cost of feeds, high cost of transportation, security challenges, extension contact, communal conflicts, inadequate waste disposal and poor road network. It is recommended that information on swine production should be disseminated through radio and farmers should be taught how to compound swine feeds.

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